OPERATING SUMMARY

ORANGEVILLE

1972

Ontario

Ministry of the
Environment

135 St. Clair Avenue West
Toronto 195, Ontario

We are pleased to present you with the 1972 operating summary for the water pollution control plant serving your community.

This summary contains data on the performance of the plant as well as relevant financial information. Of particular interest is the review of the year's activities in which significant items of these data are discussed in some detail by the operations engineer and his staff who, by their day-to-day involvement with the operation, are thoroughly familiar with the plant.

We appreciate your continuing interest in protecting the environment through the efficient operation of this wastewater treatment facility.

D.S. Caverly,
Assistant Deputy Minister.

D.A. McTavish, P. Eng.,
Director,
Project Operations Branch.

MINISTRY OF THE ENVIRONMENT

MINISTER
Honourable James A.C. Auld

DEPUTY MINISTER
E. Biggs

ASSISTANT DEPUTY MINISTER
D.S. Caverly

EXECUTIVE DIRECTOR
K.H. Sharpe

PROJECT OPERATIONS BRANCH

DIRECTOR
D.A. McTavish

ASSISTANT DIRECTOR
C.W. Perry

ACTING REGIONAL SUPERVISOR
B.W. Hansler

OPERATIONS ENGINEER
E. Czarnecki

135 St. Clair Avenue West
Toronto 195

ORANGEVILLE

WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF ORANGEVILLE

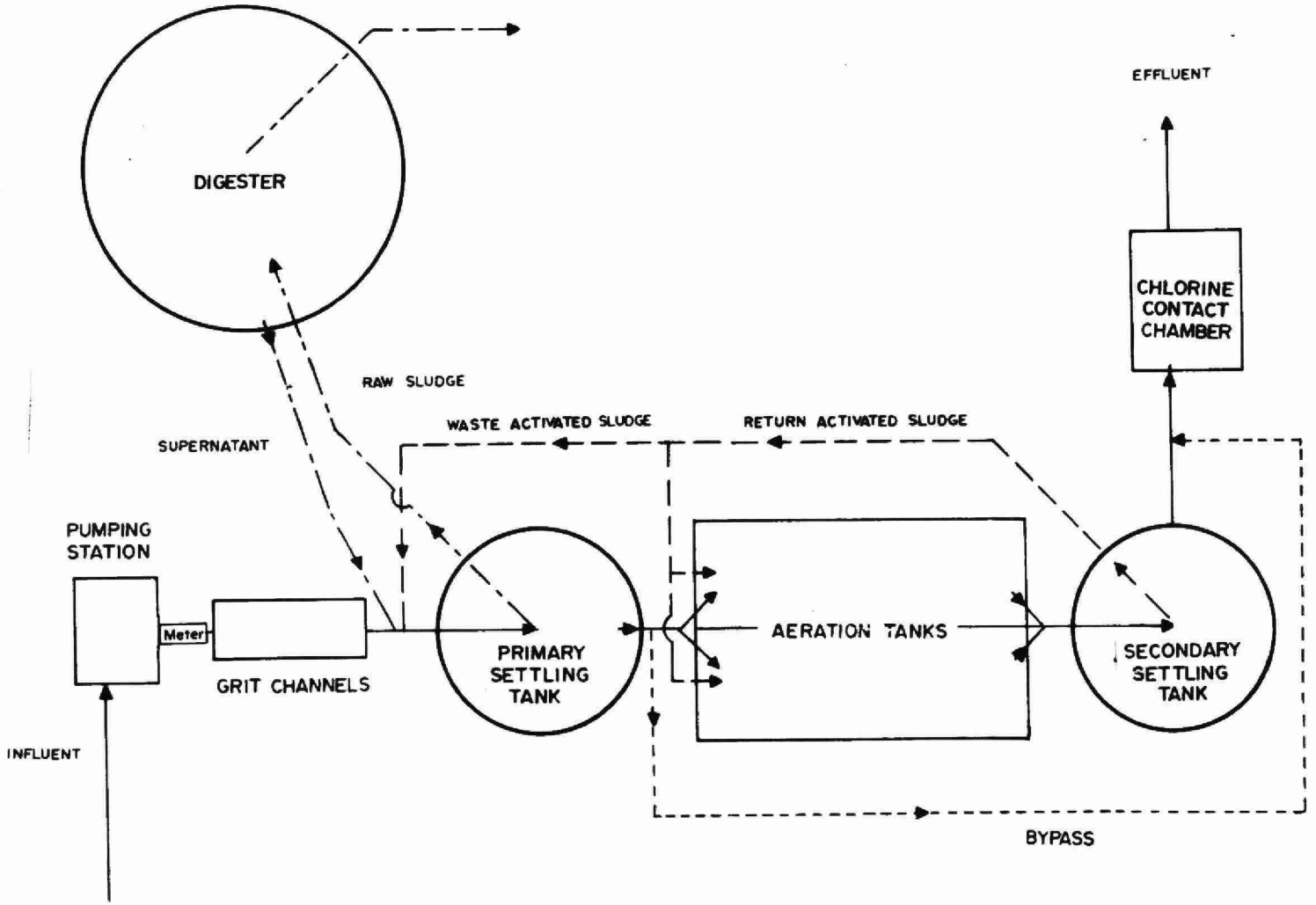
by the

MINISTRY OF THE ENVIRONMENT

1972 ANNUAL OPERATING SUMMARY

CONTENTS

ORANGEVILLE
WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT NO.	2-0208-66
TREATMENT	Activated Sludge
DESIGN FLOW	0.75 mgd
DESIGN POPULATION	7,500
BOD - Raw Sewage	200 mg/l
SS - Raw Sewage	250 mg/l

LIFT PUMPS

Type: Smart-Turner
Size: Two 300 gpm @ 20' tdh
One 500 gpm @ 25' tdh

PRIMARY TREATMENT

Grit Removal

Type: Channels, manually cleaned
Size: Two 25' x 1' 10 3/4" wide
Flow Velocity: 1 fps @ 0.366' depth

Primary Sedimentation

Type: Spiraflow (peripheral feed)
Size: One 35' dia x 12' swd
(72,000 gal)
Retention: 2.31 hr
Loading: Surface, 780 gal/ft^2/day
Weir, 7350 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Diffusee air; single-pass
Size: Two 63 x 21 x 12'
(198,000 gal)
Retention: 6.33 hr
Diffusers: Dorr Inka

Air Supply

Type: Powlesland-Bailey fan
Size: Two 3200 scfm @ 30" wc

Secondary Sedimentation

Type: Dorr
Size: One 45' dia x 9.17' swd
(97,300 gal)
Retention: 3.12 hrs
Loading: Surface, 470 gal/ft^2/day
Weir, 5820 gal/ft/day

CHLORINATION

Type: W & T
Size: One 75 lb/day

Chlorine Contact Chamber

Size: One 29.75 x 12 x 6.92'
(15,400 gal)
Retention: 29.6 min

OUTFALL

to Credit River

SLUDGE HANDLING

Digestion System - Single Stage

Type: Carter gas mixed, floating cover
Size: One 45' dia x 20' swd
(34,500 cu ft or 215,000 gal)
Loading: 1.5 lb/cu ft/mo

'72 Review

GENERAL

The average daily flow for the year was 0.85 million gallons which was an increase of 0.05 million gallons per day or approximately six percent from 1971. In 1971 the plant treated a total of 310.4 million gallons of sewage at a total cost of $37,895.00. The operating cost was $122.24 per million gallons and the cost of BOD removal was 23.6 cents per pound. Expansion of the plant will begin in 1973 from 0.75 MGD to 1.5 MGD.

PLANT FLOWS AND CHLORINATION

The total flow increase was 18.8 million gallons from the 1971 flow as compared to an increase the previous year of 14.0 million gallons.

The total chlorine consumption for 1972 was 15200 pounds. The average dosage rate required to produce an average chlorine residual of 0.5 mg/l was 4.9 mg/l.

PLANT EFFICIENCY

The average influent BOD and suspended solids concentrations were 126 mg/l and 225 mg/l respectively. The average BOD and suspended solids in the effluent were 8 mg/l and 18 mg/l with an average reduction of 93 and 92 percent respectively. The suspended solids in the effluent was above the objectives of 15 mg/l during six months of the year.

SLUDGE DIGESTION AND DISPOSAL

A total of 1.76 million gallons of raw sludge was pumped to the digester and 3231 cubic yards of digested sludge was hualed by a contractor for land disposal.

CONCLUSIONS AND RECOMMENDATIONS

Although the ydraulic load on the plant often exceeded the design value, the plant produced a very good effluent.

In view of the rather high flows received at the plant in comparison to the population, it is recommended that steps be taken to remove infiltration and/or storm water from the sanitary sewer system.

PROJECT COSTS

2-0208-66 NET CAPITAL COST	$513,283.35
DEDUCT - Portion financed by CMHC (Final)	(340,766.31)
Long Term Debt to MOE	$172,517.04
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1972	$ 12,511.04
Net Operating	$ -
Debt Retirement	2,536.00
Reserve	3,965.43
Interest Charged	13,233.37
TOTAL	$ 19,734.80

RESERVE ACCOUNT

Balance @ January 1, 1972	$ 14,364.67
Deposited by Municipality	3,965.43
Interest Earned	1,022.02
	$ 19,352.12
Less Expenditures	-
Balance @ December 31, 1972	$ 19,352.12

PROJECT COSTS

2-0016-58

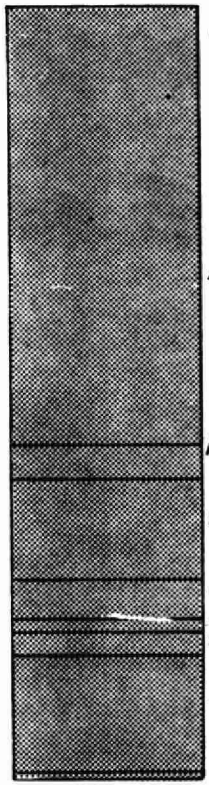
NET CAPITAL COST	$173,832.46
DEDUCT - Portion financed by	
Long Term Debt to MOE	$173,832.46
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1972	$ 61,114.51
Net Operating	$ 37,864.77
Debt Retirement	1,228.00
Reserve	
Interest Charged	9,748.35
TOTAL	$ 48,841.12

RESERVE ACCOUNT

Balance @ January 1, 1972	$ 13,969.86
Deposited by Municipality	-
Interest Earned	916.18
	$ 14,886.04
Less Expenditures	-
Balance @ December 31, 1972	$ 14,886.04

1972 COSTS

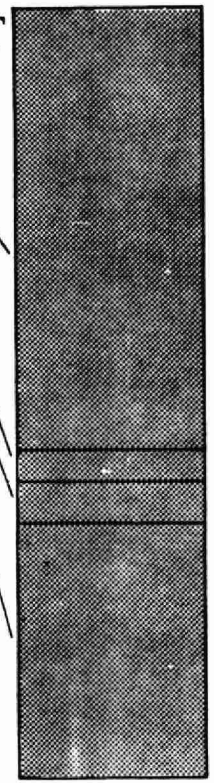
OPERATING COSTS



PAYROLL	56 %
FUEL	5 %
POWER	13 %
CHEMICALS	6 %
GENERAL SUPPLIES	2 %
EQUIPMENT	NIL %
REPAIRS & MAINTENANCE	3 %
SUNDRY	14 %
WATER	NIL %
TRAVEL	1 %

TOTAL ANNUAL COST

NET OPERATING	55 %
DEBT RETIREMENT	5 %
RESERVE	6 %
INTEREST	34 %



YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	TREATMENT COSTS $ per million gal	TREATMENT COSTS ¢ per lb BOD
1968	233.14	19,337.78	82.94	8 cents
1969	271.20	26,579.37	98.01	7 cents
1970	277.6	33,637.51	121.17	12 cents
1971	291.6	36,711.37	125.90	16 cents
1972	310.4	37,895.00	122.10	24 cents

MONTHLY OPERATING COSTS

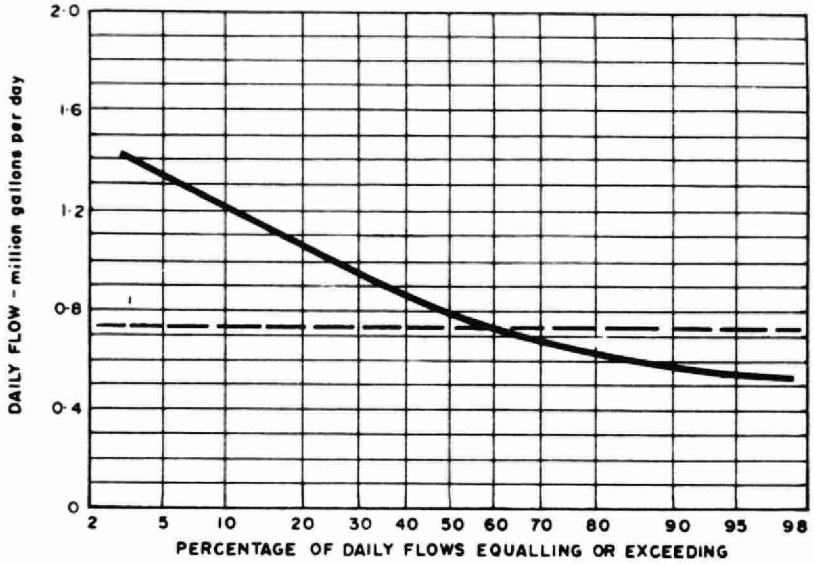
MONTH	TOTAL EXPENDITURE	REGULAR PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY*	WATER	TRAVEL
JAN	2109.93	1431.45		212.52	432.40					26.00		7.56
FEB	3112.23	1461.93		219.21	453.31		133.28		83.40	754.50		6.60
MAR	2859.07	1452.52		141.52	406.57	278.25	112.14		207.96	252.58		7.53
APR	2786.72	1548.86		172.79	459.47	278.25	199.69		85.94	34.13		7.59
MAY	2539.43	1558.94		185.58	422.56		4.00		66.23	295.10		7.02
JUNE	3394.71	2134.88		133.17	415.09	175.50	111.97		86.25	318.10		19.95
JULY	984.38	38.27		106.04	311.44	472.95	4.00		24.83	19.52		7.33
AUG	3197.78	1445.31	510.68		427.36	177.00	101.35			524.44		11.64
SEPT	3499.48	1509.45	408.37	198.92		46.19	52.81		134.13	1137.73		11.88
OCT	3398.56	1709.34			696.16	177.00	81.82		62.18	672.06		
NOV												
DEC	10012.51	5716.07	142.58	476.00	790.73	609.12	140.28		508.29	1486.66		142.78
TOTAL	37895.00	20007.02	1061.63	1845.75	4815.09	2214.26	941.34		1259.21	5520.82		229.88

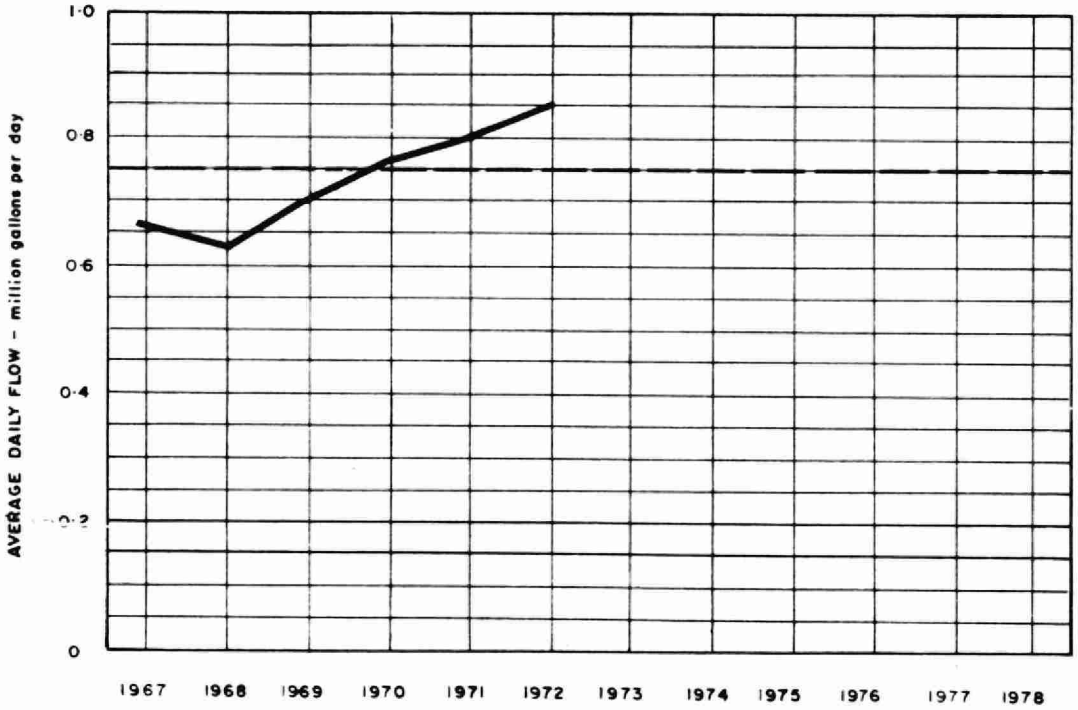
Brackets indicate credit.

* Sundry includes sludge haulage costs of $4671.00

PROCESS DATA

FLOWS



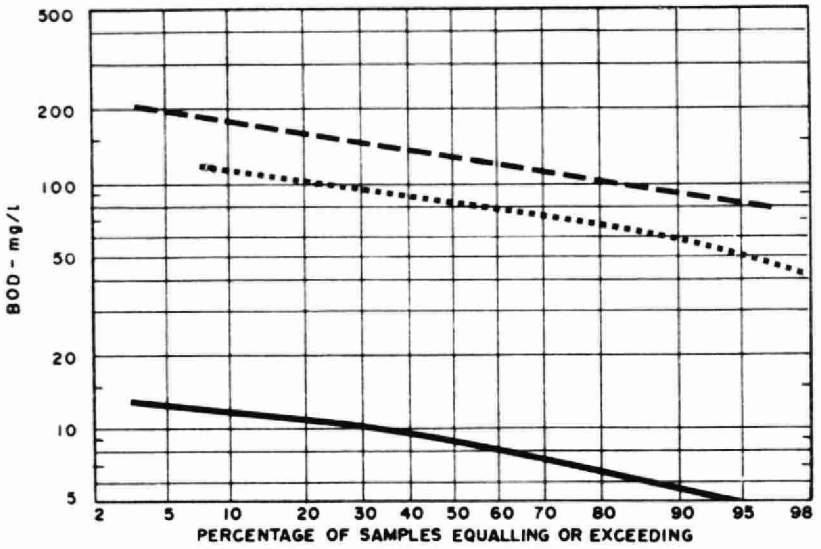


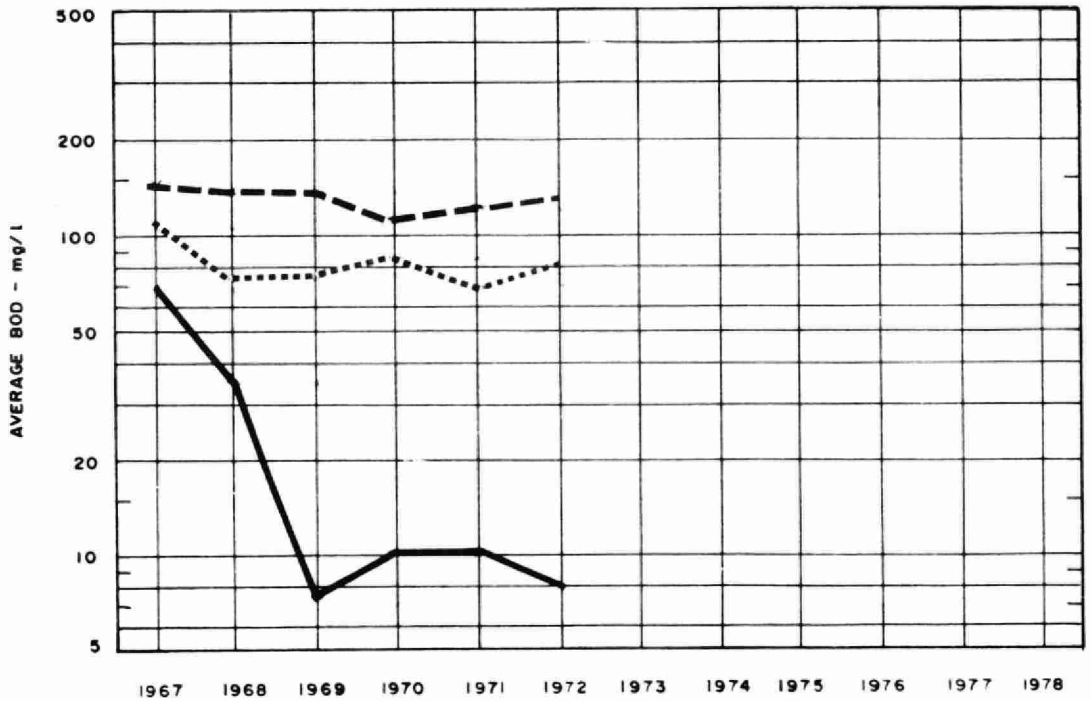
DESIGN CAPACITY _ _ _ _ _ _ _

PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10^3 pounds	mg/l	mg/l	%	10^3 pounds	mg/l P	mg/l P
JAN	25.9	.83	1.06	110	14	87	24.8	150	24	83	32.3	9.0	5.0
FEB	21.0	.72	.83	145	10	93	28.3	195	23	88	36.1	9.4	1.5
MAR	25.9	.83	1.10	135	9	93	32.6	200	25	88	45.2	9.9	1.7
APR	40.6	1.35	1.58	70	9	87	24.7	525	35	93	198.7	5.9	2.2
MAY	33.1	1.07	1.47	107	9	92	32.5	295	27	91	88.8	34.8	5.8
JUNE	27.2	.91	1.33	97	5	95	25.0	160	7	96	41.6	9.0	4.2
JULY	24.5	.79	.99	128	6	95	29.9	180	12	93	41.2	10.3	4.8
AUG	19.9	.64	.78	160	9	94	30.1	270	15	95	50.8	10.2	7.7
SEPT	17.5	.58	.79	155	8	95	25.7	205	7	96	34.6	14.0	7.7
OCT	20.6	.66	1.20	200	9	96	39.4	155	15	90	28.9	17.0	8.5
NOV	24.4	.81	1.22	130	6	95	30.2	170	7	96	39.7	12.0	5.3
DEC	29.8	.96	1.43	120	11	91	32.4	140	30	78	32.7	8.8	5.6
TOTAL	310.4	-	-	-	-	-	355.6	-	-	-	670.6	-	-
AVG.		.85	MAXIMUM 1.58	126	8	93	29.6	225	18	92	55.9	12.4	4.9
No. of Samples	-	-	-	23	23	-	-	23	23	-	-	23	23

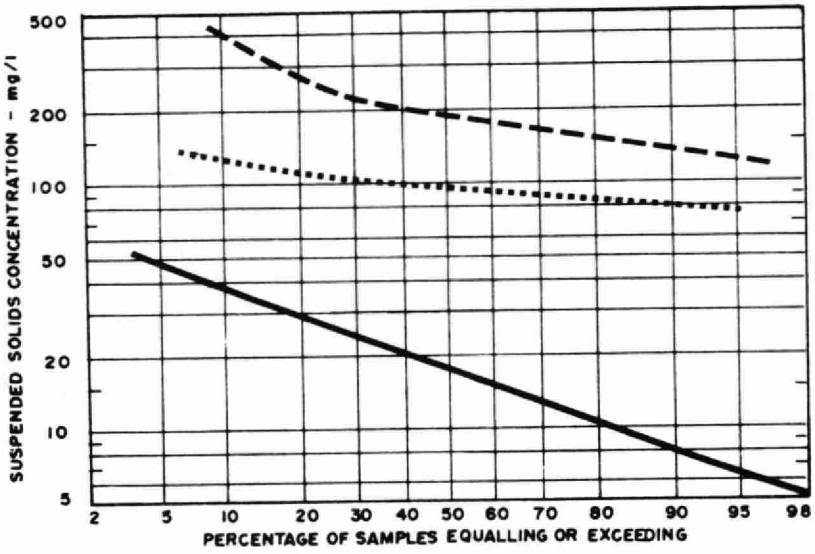
BIOCHEMICAL OXYGEN DEMAND

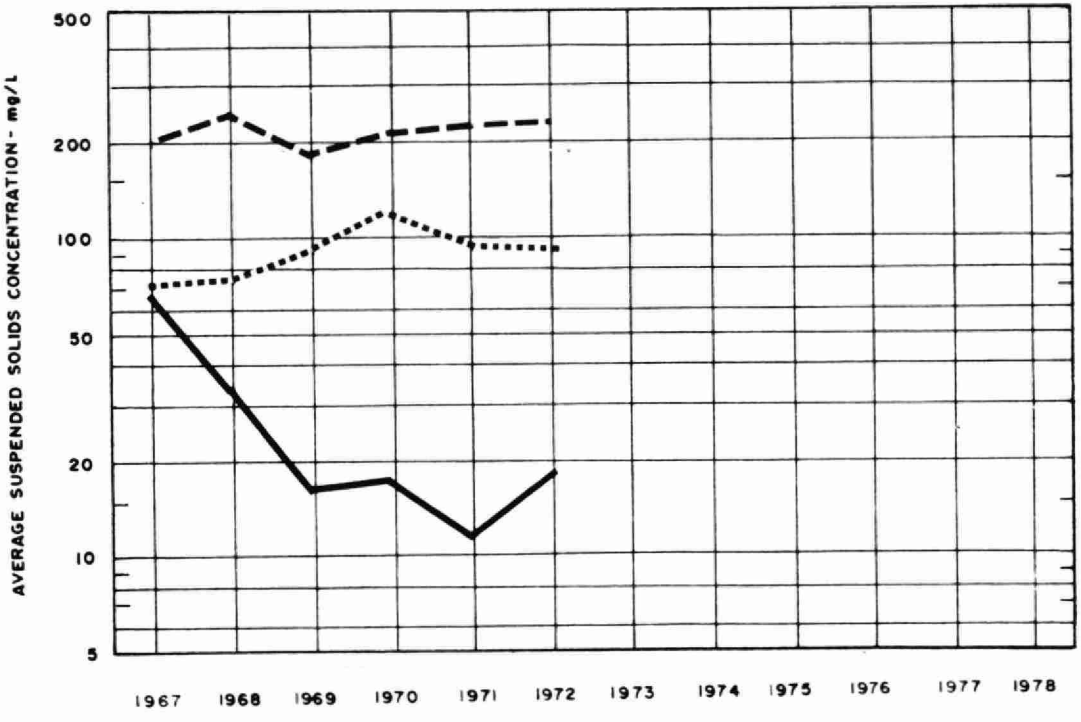




PLANT INFLUENT
PRIMARY EFFLUENT
PLANT EFFLUENT

SUSPENDED SOLIDS

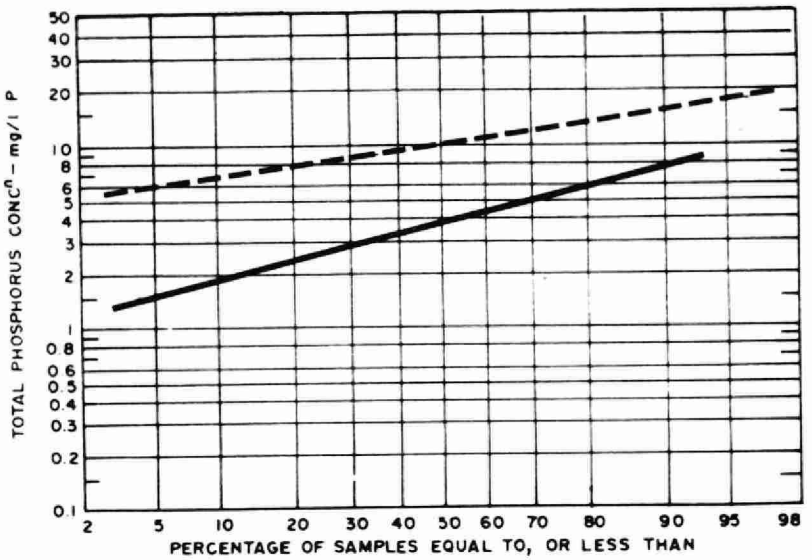


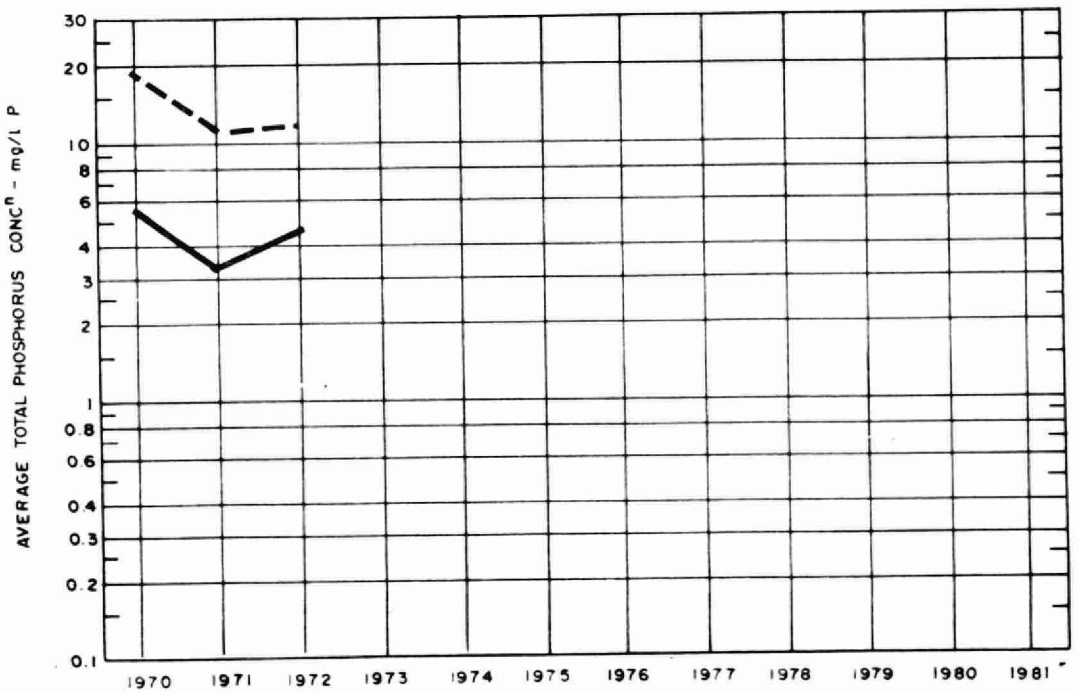


PLANT INFLUENT

PLANT EFFLUENT

PHOSPHORUS

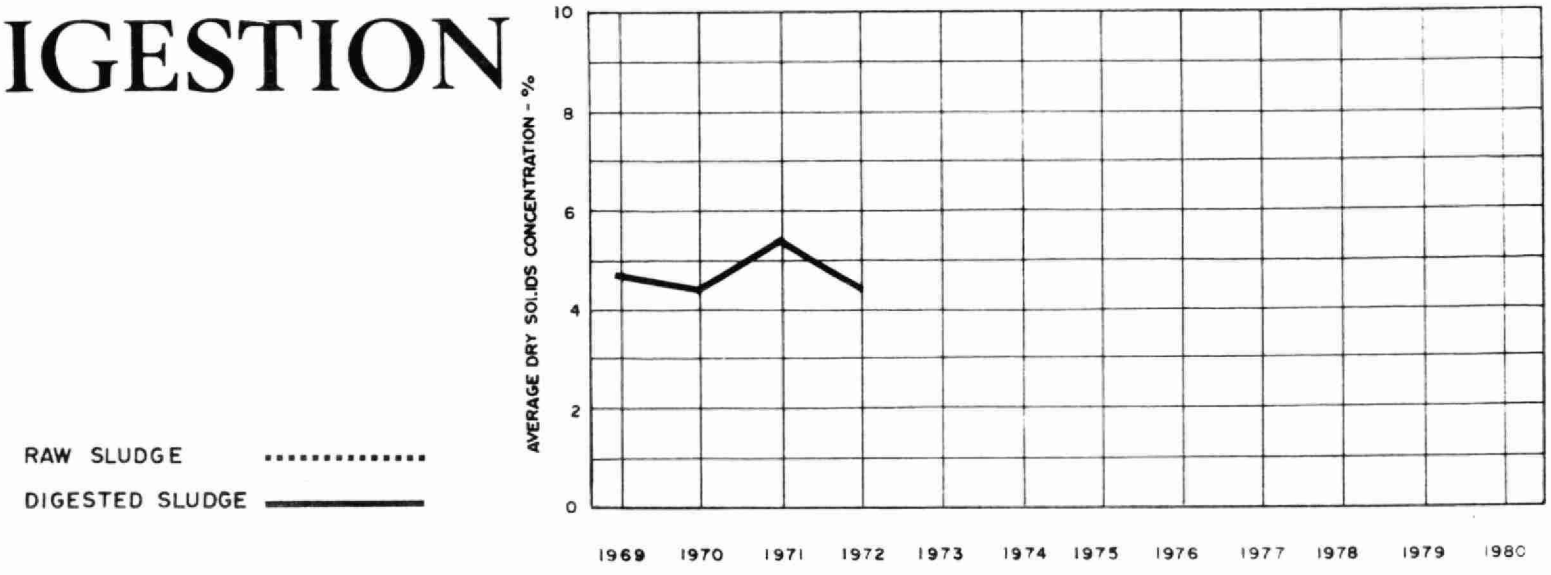


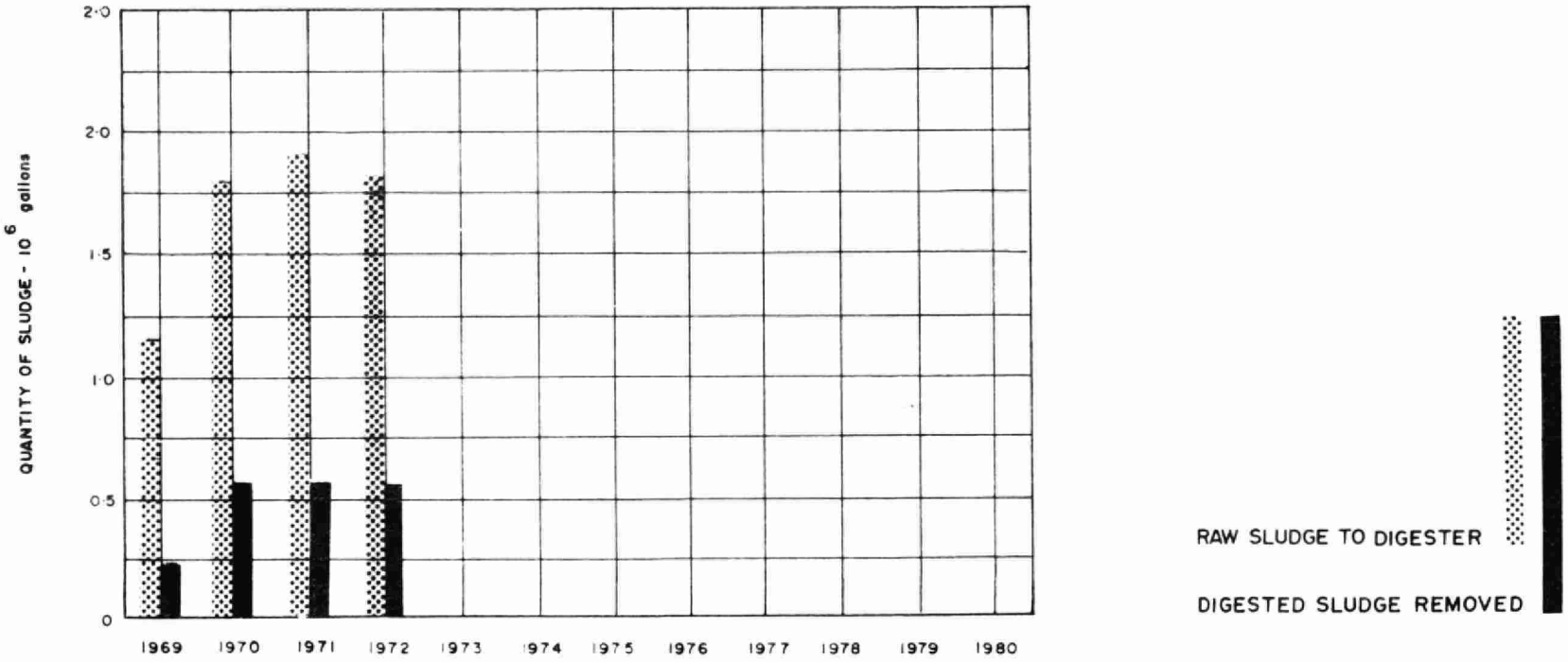


PLANT INFLUENT

PLANT EFFLUENT

DIGESTION


AVERAGE DRY SOLIDS CONCENTRATION - %
10
8
6
4
2
0
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
RAW SLUDGE
DIGESTED SLUDGE


QUANTITY OF SLUDGE - 10^6 gallons
2·0
2·0
1·5
1·0
0·5
0
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
RAW SLUDGE TO DIGESTER
DIGESTED SLUDGE REMOVED

TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
									RAW SLUDGE			DIGESTED SLUDGE			SUPER-NATANT	
	QUANTITY REMOVED cubic feet	Cl_2 USED 10^3 pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day^{-1}	AIR $\frac{1000\ ft^3}{lb\ BOD}$	QUANTITY 10^3 gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10^3 gallons	TOTAL SOLIDS %	VOL. SOLIDS %	T. S. %	AMOUNT HAULED cubic yards
JAN	0	1.3	4.9	85	85	3400	.10	8.8	176			42	6.1			252
FEB	0	1.2	5.7	93	105	2500	.14	7.5	147			23				135
MAR	0	1.3	5.1	82	143	3800	.09	7.8	169			32				189
APR	0	1.4	3.6	42	110	4000	.07	10.3	162			32	4.9			189
MAY	0	1.4	4.3	60	90	4000	.09	8.9	164			59	5.5	33		351
JUNE	0	1.3	4.7	73	83	2900	.11	8.7	147			73	4.7			432
JULY	60	1.2	5.2	66	80	3700	.07	12.1	154			58	4.0			342
AUG	0	1.2	6.1	92	77	4400	.07	9.7	133			65	4.1			387
SEPT	0	1.1	6.3	100	95	2400	.12	9.1	122			56	3.6			333
OCT	0	1.3	6.1	120	80	2100	.19	7.4	127			47	3.9			279
NOV	0	1.2	5.1	95	75	1900	.20	7.8	122			48	4.3			288
DEC	0	1.3	4.3	85	70	2400	.17	7.8	137			9				54
TOTAL	60	15.2	–	–	–	–	–	–	1757	–	–	543	–	–	–	3231
AVG.	.2 cu. ft/mil gal	1.2	4.9	80	92	3100	.12	8.8	146			45	4.6	33		269